

Confidentiality Requested:

Yes No

**KANSAS CORPORATION COMMISSION
OIL & GAS CONSERVATION DIVISION**

Form ACO-1

January 2018

Form must be Typed

Form must be Signed

All blanks must be Filled

**WELL COMPLETION FORM
WELL HISTORY - DESCRIPTION OF WELL & LEASE**

OPERATOR: License # _____

Name: _____

Address 1: _____

Address 2: _____

City: _____ State: _____ Zip: _____ + _____

Contact Person: _____

Phone: (_____) _____

CONTRACTOR: License # _____

Name: _____

Wellsite Geologist: _____

Purchaser: _____

Designate Type of Completion:

New Well Re-Entry Workover

Oil WSW SWD

Gas DH EOR

OG GSW

CM (Coal Bed Methane)

Cathodic Other (Core, Expl., etc.): _____

If Workover/Re-entry: Old Well Info as follows:

Operator: _____

Well Name: _____

Original Comp. Date: _____ Original Total Depth: _____

Deepening Re-perf. Conv. to EOR Conv. to SWD

Plug Back Liner Conv. to GSW Conv. to Producer

Commingled Permit #: _____

Dual Completion Permit #: _____

SWD Permit #: _____

EOR Permit #: _____

GSW Permit #: _____

Spud Date or Recompletion Date _____ Date Reached TD _____ Completion Date or Recompletion Date _____

API No.: _____

Spot Description: _____

_____ - _____ - _____ Sec. _____ Twp. _____ S. R. _____ East West

_____ Feet from North / South Line of Section

_____ Feet from East / West Line of Section

Footages Calculated from Nearest Outside Section Corner:

NE NW SE SW

GPS Location: Lat: _____, Long: _____
(e.g. xx.xxxxx) (e.g. -xxx.xxxxx)

Datum: NAD27 NAD83 WGS84

County: _____

Lease Name: _____ Well #: _____

Field Name: _____

Producing Formation: _____

Elevation: Ground: _____ Kelly Bushing: _____

Total Vertical Depth: _____ Plug Back Total Depth: _____

Amount of Surface Pipe Set and Cemented at: _____ Feet

Multiple Stage Cementing Collar Used? Yes No

If yes, show depth set: _____ Feet

If Alternate II completion, cement circulated from: _____

feet depth to: _____ w/ _____ sx cmt.

Drilling Fluid Management Plan

(Data must be collected from the Reserve Pit)

Chloride content: _____ ppm Fluid volume: _____ bbls

Dewatering method used: _____

Location of fluid disposal if hauled offsite:

Operator Name: _____

Lease Name: _____ License #: _____

Quarter _____ Sec. _____ Twp. _____ S. R. _____ East West

County: _____ Permit #: _____

AFFIDAVIT

I am the affiant and I hereby certify that all requirements of the statutes, rules and regulations promulgated to regulate the oil and gas industry have been fully complied with and the statements herein are complete and correct to the best of my knowledge.

Submitted Electronically

KCC Office Use ONLY

Confidentiality Requested

Date: _____

Confidential Release Date: _____

Wireline Log Received Drill Stem Tests Received

Geologist Report / Mud Logs Received

UIC Distribution

ALT I II III Approved by: _____ Date: _____

Operator Name: _____ Lease Name: _____ Well #: _____

Sec. _____ Twp. _____ S. R. _____ East West County: _____

INSTRUCTIONS: Show important tops of formations penetrated. Detail all cores. Report all final copies of drill stems tests giving interval tested, time tool open and closed, flowing and shut-in pressures, whether shut-in pressure reached static level, hydrostatic pressures, bottom hole temperature, fluid recovery, and flow rates if gas to surface test, along with final chart(s). Attach extra sheet if more space is needed.

Final Radioactivity Log, Final Logs run to obtain Geophysical Data and Final Electric Logs must be emailed to kcc-well-logs@kcc.ks.gov. Digital electronic log files must be submitted in LAS version 2.0 or newer AND an image file (TIFF or PDF).

Drill Stem Tests Taken <input type="checkbox"/> Yes <input type="checkbox"/> No <i>(Attach Additional Sheets)</i> Samples Sent to Geological Survey <input type="checkbox"/> Yes <input type="checkbox"/> No Cores Taken <input type="checkbox"/> Yes <input type="checkbox"/> No Electric Log Run <input type="checkbox"/> Yes <input type="checkbox"/> No Geologist Report / Mud Logs <input type="checkbox"/> Yes <input type="checkbox"/> No List All E. Logs Run:	<input type="checkbox"/> Log Formation (Top), Depth and Datum <input type="checkbox"/> Sample Name Top Datum
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CASING RECORD <input type="checkbox"/> New <input type="checkbox"/> Used							
Report all strings set-conductor, surface, intermediate, production, etc.							
Purpose of String	Size Hole Drilled	Size Casing Set (In O.D.)	Weight Lbs. / Ft.	Setting Depth	Type of Cement	# Sacks Used	Type and Percent Additives

ADDITIONAL CEMENTING / SQUEEZE RECORD				
Purpose:	Depth Top Bottom	Type of Cement	# Sacks Used	Type and Percent Additives
<input type="checkbox"/> Perforate <input type="checkbox"/> Protect Casing <input type="checkbox"/> Plug Back TD <input type="checkbox"/> Plug Off Zone				

1. Did you perform a hydraulic fracturing treatment on this well? Yes No *(If No, skip questions 2 and 3)*
2. Does the volume of the total base fluid of the hydraulic fracturing treatment exceed 350,000 gallons? Yes No *(If No, skip question 3)*
3. Was the hydraulic fracturing treatment information submitted to the chemical disclosure registry? Yes No *(If No, fill out Page Three of the ACO-1)*

Date of first Production/Injection or Resumed Production/Injection:	Producing Method: <input type="checkbox"/> Flowing <input type="checkbox"/> Pumping <input type="checkbox"/> Gas Lift <input type="checkbox"/> Other <i>(Explain)</i> _____				
Estimated Production Per 24 Hours	Oil Bbls.	Gas Mcf	Water Bbls.	Gas-Oil Ratio	Gravity

DISPOSITION OF GAS: <input type="checkbox"/> Vented <input type="checkbox"/> Sold <input type="checkbox"/> Used on Lease <i>(If vented, Submit ACO-18.)</i>	METHOD OF COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Perf. <input type="checkbox"/> Dually Comp. <input type="checkbox"/> Commingled <i>(Submit ACO-5) (Submit ACO-4)</i>	PRODUCTION INTERVAL: Top Bottom
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Shots Per Foot	Perforation Top	Perforation Bottom	Bridge Plug Type	Bridge Plug Set At	Acid, Fracture, Shot, Cementing Squeeze Record <i>(Amount and Kind of Material Used)</i>

TUBING RECORD:	Size:	Set At:	Packer At:	
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Form	ACO1 - Well Completion
Operator	Murfin Drilling Co., Inc.
Well Name	CULWELL 'K' 1-20
Doc ID	1494696

All Electric Logs Run

DIL
DUCP
MEL
BHCS



CEMENT TREATMENT REPORT

Customer:	Murfin Drilling	Well:	Culwell K 1-20	Ticket:	ICT2900
City, State:		County:	Cheyenne KS	Date:	Dec. 7th 2019
Field Rep:	Jay	S-T-R:	20-2-37	Service:	Surface

Downhole Information

Hole Size:	12.25 in
Hole Depth:	303 ft
Casing Size:	8 5/8 in
Casing Depth:	303 ft
Tubing / Liner:	in
Depth:	ft
Tool / Packer:	
Depth:	ft
Displacement:	18.0 bbls

Calculated Slurry

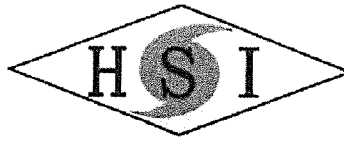
Weight:	14.8 # / sx
Water / Sx:	6.88 gal / sx
Yield:	1.41 ft ³ / sx
Bbls / Ft:	0.0735
Depth:	303 ft
Annular Volume:	22.2705 bbls
Excess:	
Total Slurry:	71.6 bbls
Total Sacks:	285 sx

Product	% / #	#
Class A	100.00	26780
Poz		
Gel	2.00	536
CaCl	3.00	804
Gypsum		
Motso		
Koi Seal		
Flo Seal	0.25	67
Salt (bww)		

Total 28,196

TIME	RATE	PSI	BBLs	REMARKS
8:00 PM				Arrive on location. Late to location due to blown steer tire on bulk truck
8:05 PM				Safety meeting
8:10 PM				Rig up pump and lines
				Rig circulating through 8 5/8 casing when arrived
8:30 PM	2.0	190.0	72.0	Mix 285 sks of H235 at 14.8 ppg. Cement mixed at 2 bbls per minute due to bulk truck delivery
9:00 PM	6.6	180.0	18.0	Displace
9:05 PM				End displacement.
9:10 PM		100.0		Shut in well
9:15 PM				Release pressure
9:30 PM				Wash up pump and lines
9:45 PM				Rig down
10:00 PM				Depart

CREW		UNIT	SUMMARY		
Cementer:	Dane	67	Average Rate	Average Pressure	Total Fluid
Pump Operator:	Michael	266	3.75 bpm	157 psi	90 bbls
Bulk #1:	Jesse	292			
Bulk #2:					



CEMENT TREATMENT REPORT

Customer:	Murfin Drilling	Well:	Culwell K #1-20	Ticket:	ICT 2963
City, State:		County:	Cheyenne, KS	Date:	12/16/2019
Field Rep:		S-T-R:	20-2s-37w	Service:	Rotary Plug

Downhole Information	
Hole Size:	7.875 In
Hole Depth:	ft
Casing Size:	8.625 In
Casing Depth:	ft
Tubing / Liner:	In
Depth:	ft
Tool / Packer:	
Depth:	ft
Displacement:	bbls

Calculated Slurry	
Weight:	13.8 # / sx
Water / Sx:	6.90 gal / sx
Yield:	1.42 ft ³ / sx
Bbls / Ft.:	0.0406
Depth:	ft
Annular Volume:	0 bbls
Excess:	
Total Slurry:	64.5 bbls
Total Sacks:	255 sx

Product	% / #	#
Class A	60.00	14382
Poz	40.00	7548
Gel	4.00	877
CaCl		
Gypsum		
Metso		
Kol Seal		
Flo Seal		
Salt (bww)		
Total		22,807

TIME	RATE	PSI	BBLs	REMARKS
5:15 AM				On location safety meeting. Spot in and rig up
				Hook up to drill pipe @ 3260'
	3.5	150.0	8.5	Pump 8.5 BBL water
	3.5	150.0	12.6	Mix and pump 50 sacks cement
	3.5	150.0	3.0	Pump 3 BBL water
6:12 AM	7.0	150.0	40.0	Displace 40 BBL mud. Pull drill pipe to 2500'. Break circulation with mud
	3.5	150.0	8.5	Pump 8.5 BBL water
	3.5	150.0	26.3	Mix and pump 100 sacks cement
	3.5	150.0	3.0	Pump 3 BBL water
7:14 AM	7.0	150.0	26.0	Displace 26 BBL mud. Pull drill pipe to 350'. Break circulaton with water
	4.0	100.0		Pump 23 BBL water
	4.0	100.0		Mix and pump 60 sacks cement
	4.0	100.0		Displace 3.08 BBL
				Pull drill pipe out of hole
				Run wooden plug down to 40'
	1.5	50.0	2.5	Mix and pump 10 sacks cement. Good cement to surface
	1.5	50.0	8.9	Plug rat hole with 35 sacks cement
9:30 AM	1.5	50.0	3.8	Plug mouse hole with 15 sacks cement

CREW		UNIT	SUMMARY		
Cementer:	Jake H	77	Average Rate	Average Pressure	Total Fluid
Pump Operator:	Mike R	266	3.67857 bpm	118 psi	142 bbls
Bulk #1:	Kate	181-256			
Bulk #2:					

Robert D. Hendrix

Petroleum Geologist

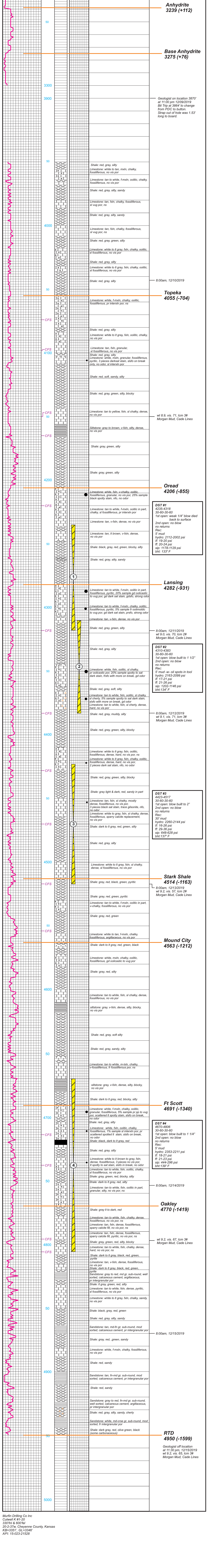
GEOLOGIST'S REPORT DRILLING TIME AND SAMPLE LOG

COMPANY	Murfin Drilling Company Inc.	ELEVATIONS	KB 3351'
LEASE	Culwell K #1-20	DF	
FIELD	Ken Southwest	GL 3346'	
LOCATION	330 Inl & 600 Fel	Measurements Are All From Kelly Busting	
SEC	20 TWP 2S RGE 37W	CASING	
COUNTY	Cheyenne STATE Kansas	CONTRACTOR	Murfin Drilling Co. Inc. Rig #3
SPUD	12/6/2019 COMP 12/15/2019	RTD	4950' L.T.D
MUD UP	3600' TYPE MUD Chemical	SAMPLES SAVED FROM	3950' TO 4950'
DRILLING TIME KEPT FROM	3950' TO 4950'	SAMPLES EXAMINED FROM	3950' TO 4950'
GEOLOGICAL SUPERVISION FROM 3870'			
GEOLOGIST ON WELL Robert D. Hendrix			

FORMATION TOPS	ELECTRIC LOG	SAMPLE
Anhydrite	3242 (+109)	3239 (+112)
Topeka	4064 (-713)	4071 (-720)
Lansing	4284 (-933)	4282 (-931)
Stark Shale	4513 (-1162)	4514 (-1163)
Mound City	4567 (-1216)	4563 (-1212)
Ft Scott	4691 (-1345)	4691 (-1340)
Oakley	4774 (-1423)	4770 (-1419)

AP# 15-023-21528

REMARKS:





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co. Inc.**

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell K #1-20

20-2s-37w Cheyenne,KS

Start Date: 2019.12.11 @ 09:30:00

End Date: 2019.12.11 @ 16:37:30

Job Ticket #: 66463 DST #: 1

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.12.17 @ 09:02:43



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne, KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66463

DST#: 1

ATTN: Robert Hendrix

Test Start: 2019.12.11 @ 09:30:00

GENERAL INFORMATION:

Formation: **LKC " A "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:35:10

Time Test Ended: 16:37:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Ryan Nichols

Unit No: 71

Interval: 4235.00 ft (KB) To 4318.00 ft (KB) (TVD)

Reference Elevations: 3351.00 ft (KB)

Total Depth: 4318.00 ft (KB) (TVD)

3346.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8366 Outside

Press@RunDepth: 24.47 psig @ 4236.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.12.11

End Date:

2019.12.11

Last Calib.:

2019.12.11

Start Time: 09:30:01

End Time:

16:37:30

Time On Btm:

2019.12.11 @ 11:35:00

Time Off Btm:

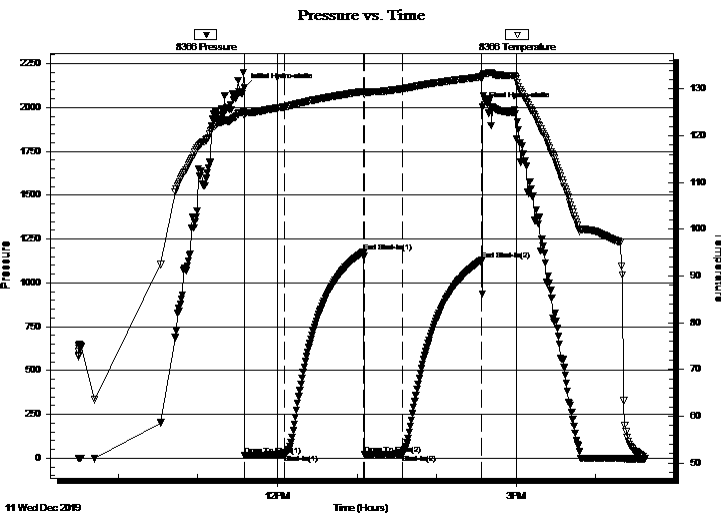
2019.12.11 @ 14:34:40

TEST COMMENT: 30 IF - Blow built to 1/4" died back to surface

60 ISI - No return

30 FF - No blow

60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2111.76	125.39	Initial Hydro-static
1	14.62	124.22	Open To Flow (1)
31	19.50	126.15	Shut-In(1)
90	1177.72	129.45	End Shut-In(1)
91	20.38	128.79	Open To Flow (2)
119	24.47	129.99	Shut-In(2)
179	1128.71	132.56	End Shut-In(2)
180	2002.21	132.87	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100%M	0.02

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne, KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66463

DST#: 1

ATTN: Robert Hendrix

Test Start: 2019.12.11 @ 09:30:00

GENERAL INFORMATION:

Formation: **LKC " A "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 11:35:10

Time Test Ended: 16:37:30

Test Type: Conventional Bottom Hole (Initial)

Tester: Ryan Nichols

Unit No: 71

Interval: 4235.00 ft (KB) To 4318.00 ft (KB) (TVD)

Total Depth: 4318.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3351.00 ft (KB)

3346.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: 8353

Inside

Press@RunDepth: psig @ 4236.00 ft (KB)

Start Date: 2019.12.11

End Date:

2019.12.11

Start Time: 09:30:01

End Time:

16:37:30

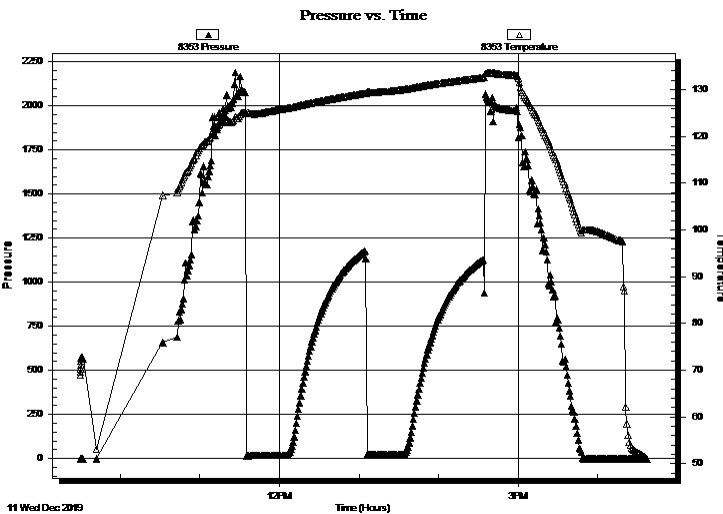
Capacity: 8000.00 psig

Last Calib.: 2019.12.11

Time On Btm:

Time Off Btm:

TEST COMMENT: 30 IF - Blow built to 1/4" died back to surface
60 ISI - No return
30 FF - No blow
60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100%M	0.02

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66463

DST#: 1

ATTN: Robert Hendrix

Test Start: 2019.12.11 @ 09:30:00

Tool Information

Drill Pipe:	Length: 4075.00 ft	Diameter: 3.80 inches	Volume: 57.16 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 148.00 ft	Diameter: 2.25 inches	Volume: 0.73 bbl	Weight to Pull Loose: 68000.00 lb
			<u>Total Volume: 57.89 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 55000.00 lb
Depth to Top Packer:	4235.00 ft			Final 55000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	83.00 ft			
Tool Length:	111.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Shut In Tool	5.00			4212.00	
Hydraulic tool	5.00			4217.00	
Jars	5.00			4222.00	
Safety Joint	3.00			4225.00	
Packer	5.00			4230.00	28.00 Bottom Of Top Packer
Packer	5.00			4235.00	
Stubb	1.00			4236.00	
Recorder	0.00	8353	Inside	4236.00	
Recorder	0.00	8366	Outside	4236.00	
Perforations	14.00			4250.00	
Blank Spacing	65.00			4315.00	
Bullnose	3.00			4318.00	83.00 Bottom Packers & Anchor

Total Tool Length: 111.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66463

DST#: 1

ATTN: Robert Hendrix

Test Start: 2019.12.11 @ 09:30:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 60.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.78 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1300.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud 100%M	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

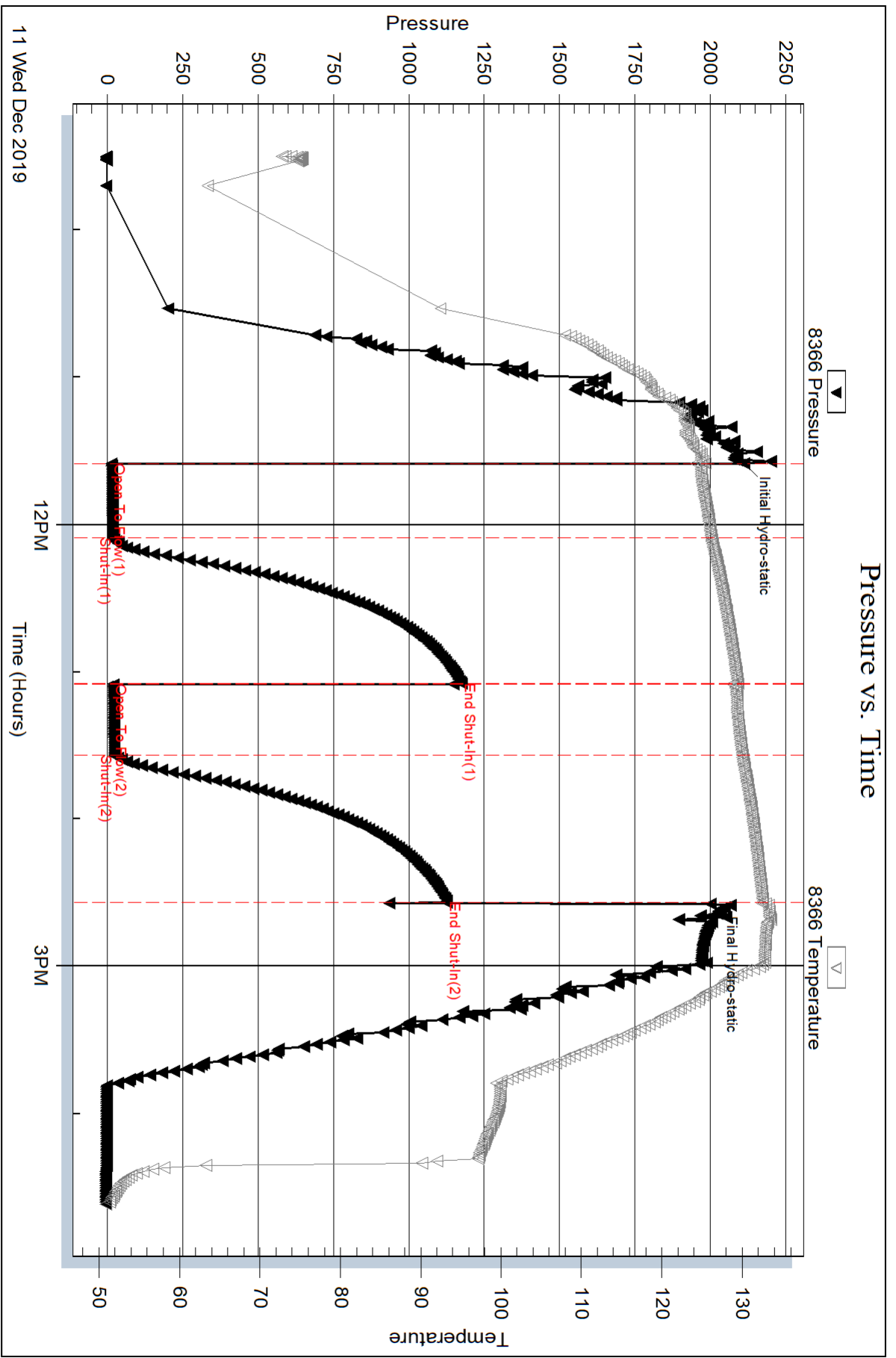
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



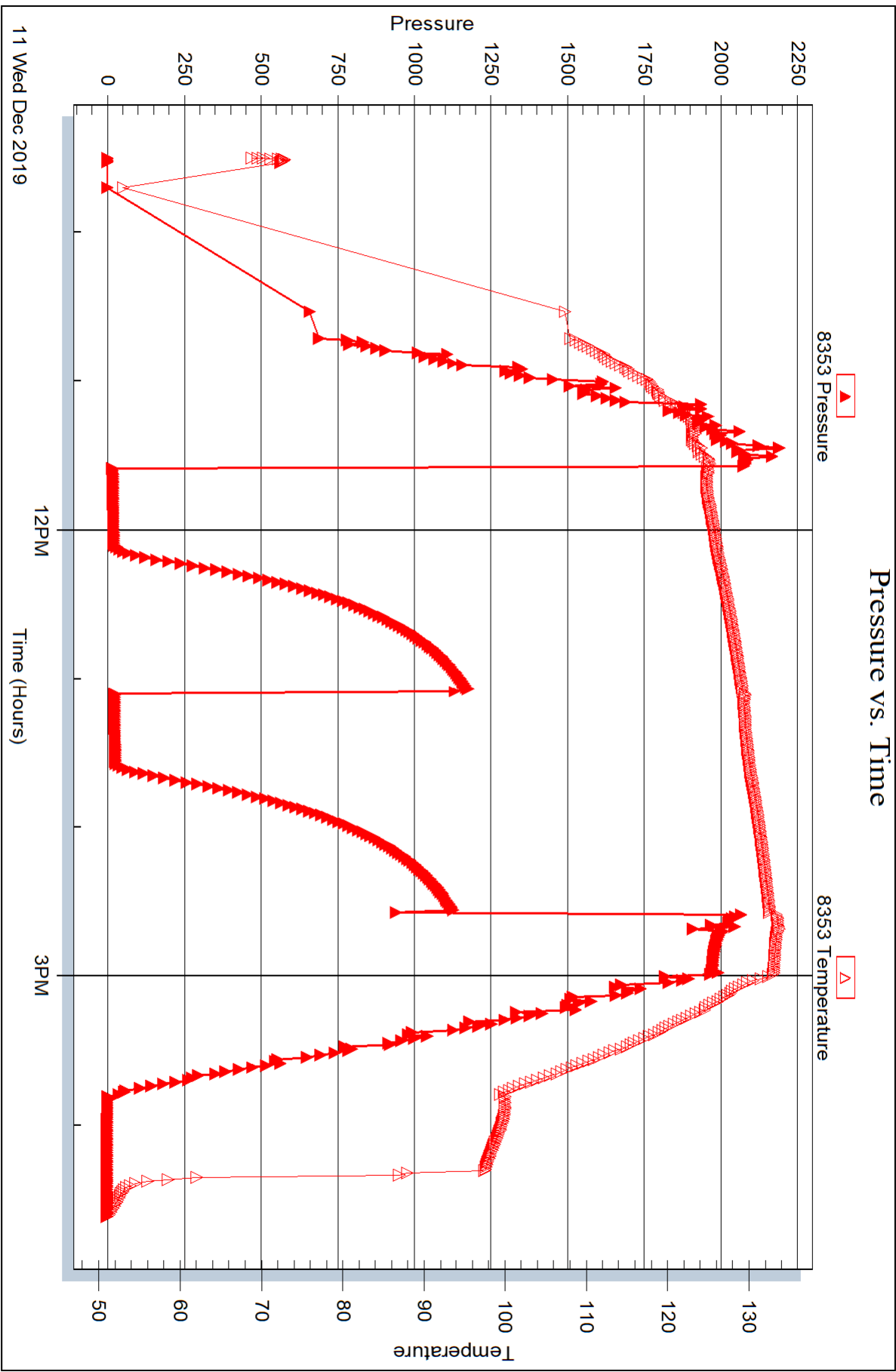
Serial #: 8353

Inside

Murfin Drilling Co. Inc.

Culw ell K #1-20

DST Test Number: 1





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co. Inc.**

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell K #1-20

20-2s-37w Cheyenne,KS

Start Date: 2019.12.12 @ 02:29:00

End Date: 2019.12.12 @ 09:32:00

Job Ticket #: 66464 DST #: 2

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.12.17 @ 09:02:18

Murfin Drilling Co. Inc.
20-2s-37w Cheyenne,KS
Culwell K #1-20
DST # 2
LKC " B "
2019.12.12



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne, KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66464

DST#: 2

ATTN: Robert Hendrix

Test Start: 2019.12.12 @ 02:29:00

GENERAL INFORMATION:

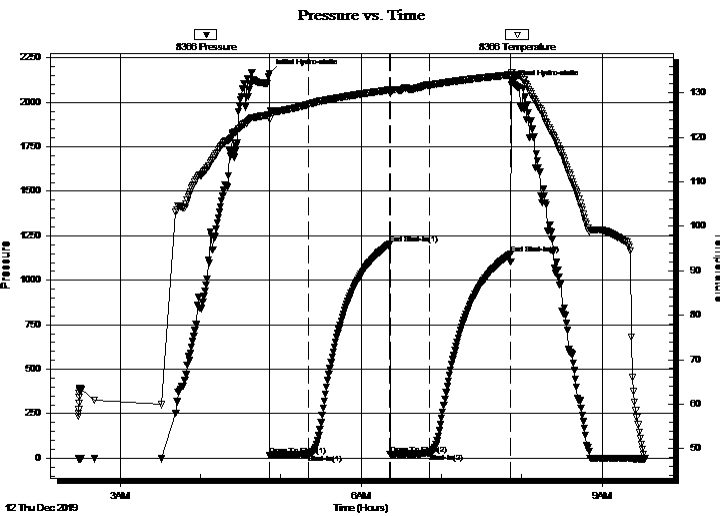
Formation: **LKC " B "**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 04:51:50
 Time Test Ended: 09:32:00
 Interval: **4310.00 ft (KB) To 4383.00 ft (KB) (TVD)**
 Total Depth: 4383.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Ryan Nichols
 Unit No: 71
 Reference Elevations: 3351.00 ft (KB)
 3346.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8366

Outside

Press@RunDepth: 26.00 psig @ 4311.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2019.12.12 End Date: 2019.12.12 Last Calib.: 2019.12.12
 Start Time: 02:29:01 End Time: 09:32:00 Time On Btm: 2019.12.12 @ 04:51:40
 Time Off Btm: 2019.12.12 @ 07:52:00

TEST COMMENT: 30 IF - Blow built to 1 1/2"
 60 ISI - No return
 30 FF - No blow
 60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2162.88	124.95	Initial Hydro-static
1	16.84	124.08	Open To Flow (1)
30	20.71	127.42	Shut-In(1)
90	1202.11	130.63	End Shut-In(1)
90	21.32	129.90	Open To Flow (2)
120	26.00	131.75	Shut-In(2)
180	1146.25	134.03	End Shut-In(2)
181	2099.32	134.59	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud w / oil spots in tool 100%M	0.02

* Recovery from multiple tests

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne, KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66464

DST#: 2

ATTN: Robert Hendrix

Test Start: 2019.12.12 @ 02:29:00

GENERAL INFORMATION:

Formation: **LKC " B "**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 04:51:50

Time Test Ended: 09:32:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Ryan Nichols

Unit No: 71

Interval: 4310.00 ft (KB) To 4383.00 ft (KB) (TVD)

Reference Elevations: 3351.00 ft (KB)

Total Depth: 4383.00 ft (KB) (TVD)

3346.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8353

Inside

Press@RunDepth: psig @ 4311.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.12.12

End Date:

2019.12.12

Last Calib.:

2019.12.12

Start Time: 02:29:01

End Time:

09:31:50

Time On Btm:

Time Off Btm:

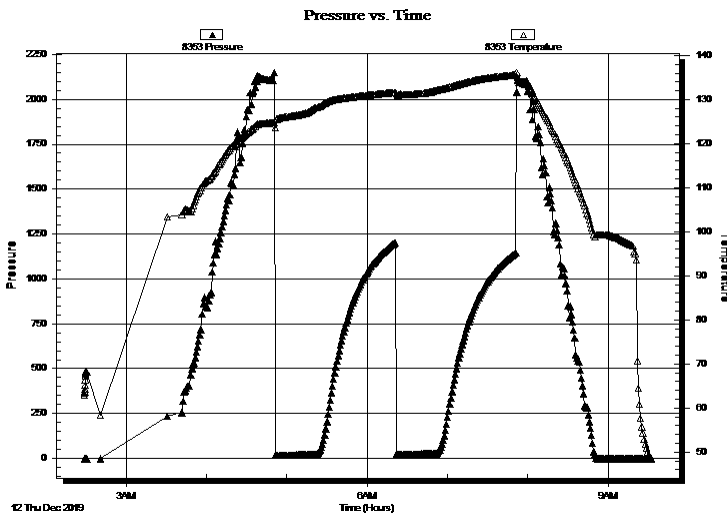
TEST COMMENT: 30 IF - Blow built to 1 1/2"

60 ISI - No return

30 FF - No blow

60 FSI - No return

PRESSURE SUMMARY



Time (Min.)

Pressure (psig)

Temp (deg F)

Annotation

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud w / oil spots in tool 100%M	0.02

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66464

DST#: 2

ATTN: Robert Hendrix

Test Start: 2019.12.12 @ 02:29:00

Tool Information

Drill Pipe:	Length: 4166.00 ft	Diameter: 3.80 inches	Volume: 58.44 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 148.00 ft	Diameter: 2.25 inches	Volume: 0.73 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 59.17 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	32.00 ft			String Weight: Initial 55000.00 lb
Depth to Top Packer:	4310.00 ft			Final 55000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	73.00 ft			
Tool Length:	101.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Shut In Tool	5.00			4287.00	
Hydraulic tool	5.00			4292.00	
Jars	5.00			4297.00	
Safety Joint	3.00			4300.00	
Packer	5.00			4305.00	28.00 Bottom Of Top Packer
Packer	5.00			4310.00	
Stubb	1.00			4311.00	
Recorder	0.00	8353	Inside	4311.00	
Recorder	0.00	8366	Outside	4311.00	
Perforations	5.00			4316.00	
Blank Spacing	64.00			4380.00	
Bullnose	3.00			4383.00	73.00 Bottom Packers & Anchor

Total Tool Length: 101.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66464

DST#: 2

ATTN: Robert Hendrix

Test Start: 2019.12.12 @ 02:29:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 70.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.78 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 900.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud w / oil spots in tool 100%M	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

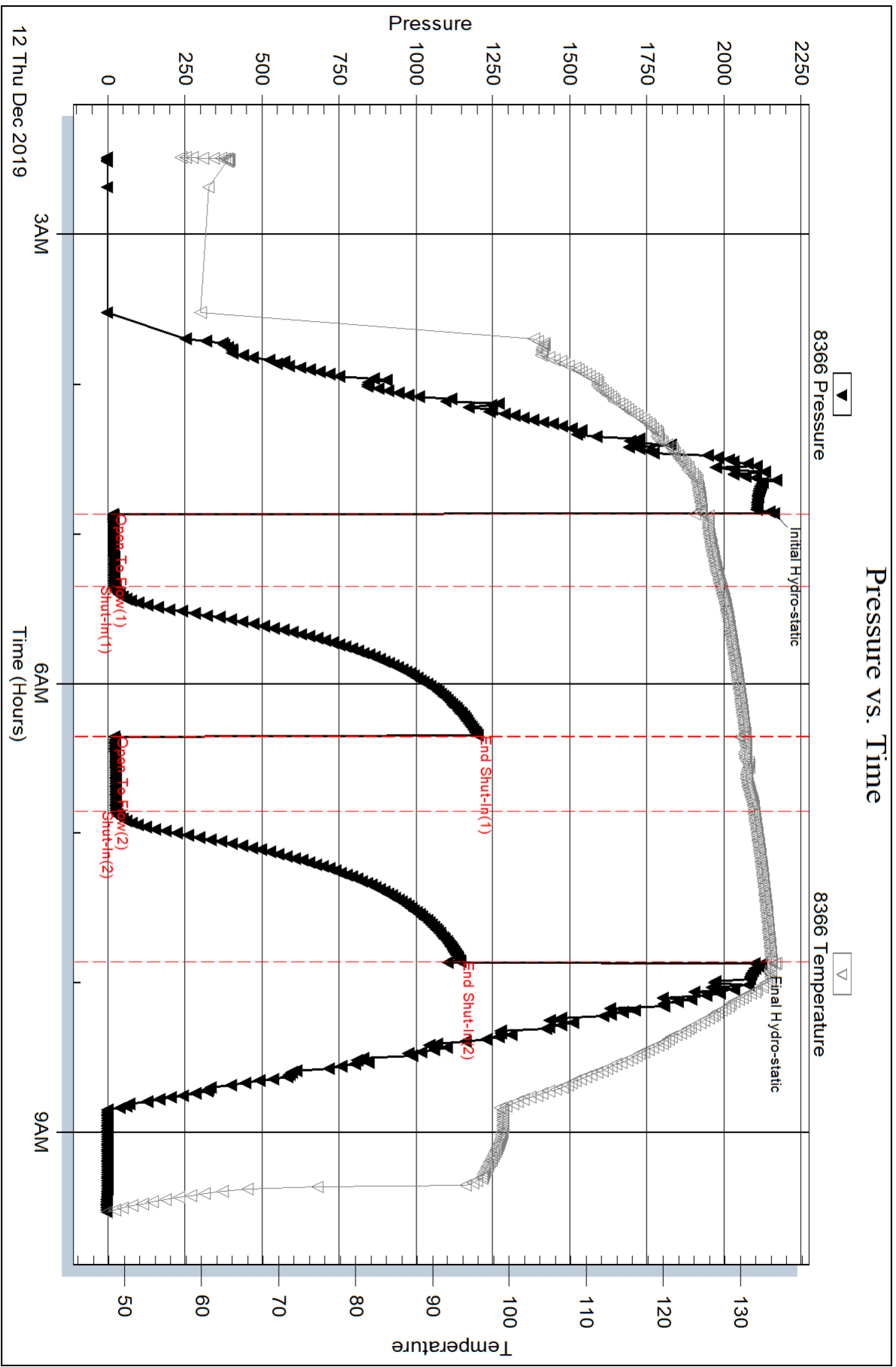
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



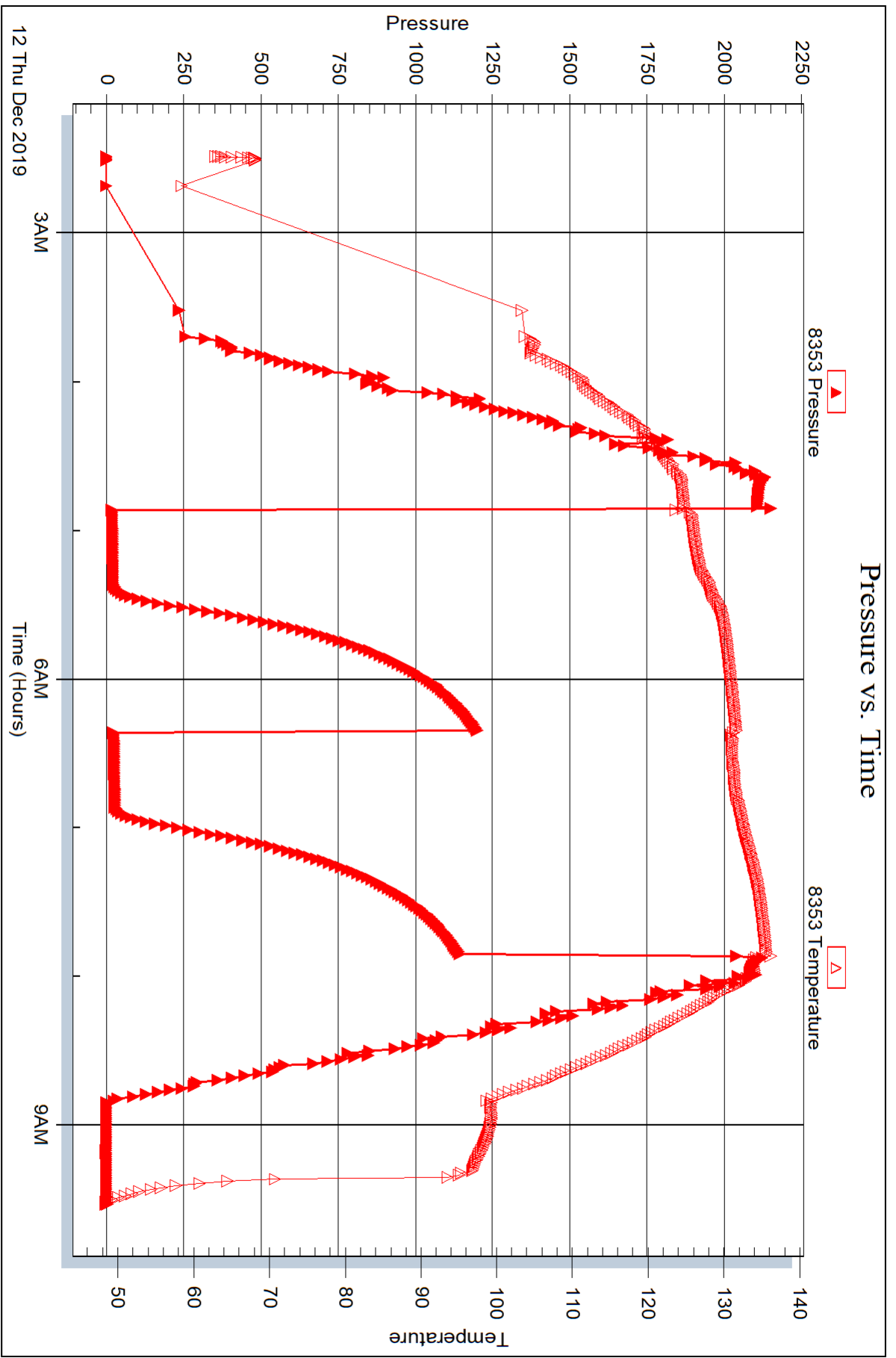
Serial #: 8353

Inside

Murfin Drilling Co. Inc.

Culw ell K #1-20

DST Test Number: 2





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co. Inc.**

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell K #1-20

20-2s-37w Cheyenne,KS

Start Date: 2019.12.13 @ 01:58:00

End Date: 2019.12.13 @ 09:40:00

Job Ticket #: 66465 DST #: 3

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.12.17 @ 09:01:33

Murfin Drilling Co. Inc. 20-2s-37w Cheyenne,KS Culwell K #1-20 DST # 3 LKG " H - J " 2019.12.13



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne, KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66465

DST#: 3

ATTN: Robert Hendrix

Test Start: 2019.12.13 @ 01:58:00

GENERAL INFORMATION:

Formation: **LKC "H - J"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 04:57:00

Time Test Ended: 09:40:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Ryan Nichols

Unit No: 71

Interval: 4423.00 ft (KB) To 4517.00 ft (KB) (TVD)

Reference Elevations: 3351.00 ft (KB)

Total Depth: 4517.00 ft (KB) (TVD)

3346.00 ft (CF)

Hole Diameter: 7.88 inches Hole Condition: Good

KB to GR/CF: 5.00 ft

Serial #: 8366 Outside

Press@RunDepth: 35.98 psig @ 4424.00 ft (KB)

Capacity: 8000.00 psig

Start Date: 2019.12.13

End Date:

2019.12.13

Last Calib.: 2019.12.13

Start Time: 01:58:01

End Time:

09:40:00

Time On Btm: 2019.12.13 @ 04:56:50

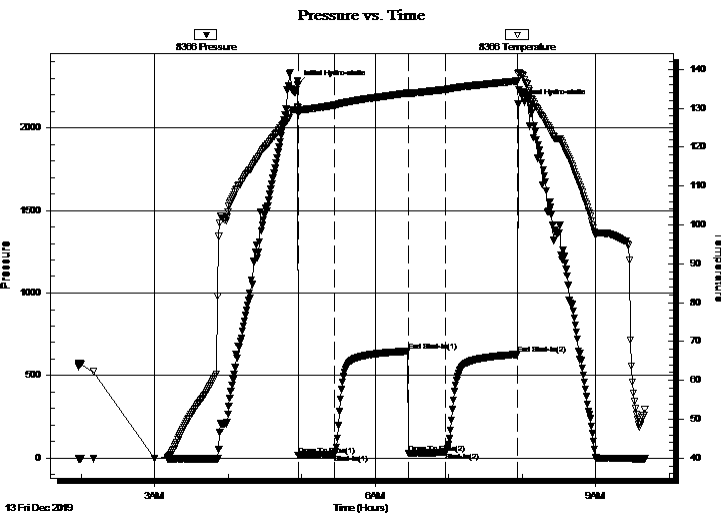
Time Off Btm: 2019.12.13 @ 07:56:30

TEST COMMENT: 30 IF - Blow built to 2"

60 ISI - No return

30 FF - No blow

60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2259.82	130.18	Initial Hydro-static
1	16.04	128.68	Open To Flow (1)
30	26.27	130.77	Shut-In(1)
90	647.83	133.90	End Shut-In(1)
91	28.70	133.66	Open To Flow (2)
121	35.98	134.80	Shut-In(2)
180	628.03	136.98	End Shut-In(2)
180	2143.51	138.94	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
30.00	Mud 100%M	0.15

* Recovery from multiple tests

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



TRILOBITE
TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

20-2s-37w Cheyenne,KS

Culwell K #1-20

Job Ticket: 66465

DST#: 3

Test Start: 2019.12.13 @ 01:58:00

GENERAL INFORMATION:

Formation: **LKC "H - J"**

Deviated: No Whipstock: ft (KB)

Time Tool Opened: 04:57:00

Time Test Ended: 09:40:00

Test Type: Conventional Bottom Hole (Reset)

Tester: Ryan Nichols

Unit No: 71

Interval: 4423.00 ft (KB) To 4517.00 ft (KB) (TVD)

Total Depth: 4517.00 ft (KB) (TVD)

Hole Diameter: 7.88 inches Hole Condition: Good

Reference Elevations: 3351.00 ft (KB)

3346.00 ft (CF)

KB to GR/CF: 5.00 ft

Serial #: 8353

Inside

Press@RunDepth: psig @ 4424.00 ft (KB)

Start Date: 2019.12.13

End Date: 2019.12.13

Capacity: 8000.00 psig

Last Calib.: 2019.12.13

Start Time: 01:58:01

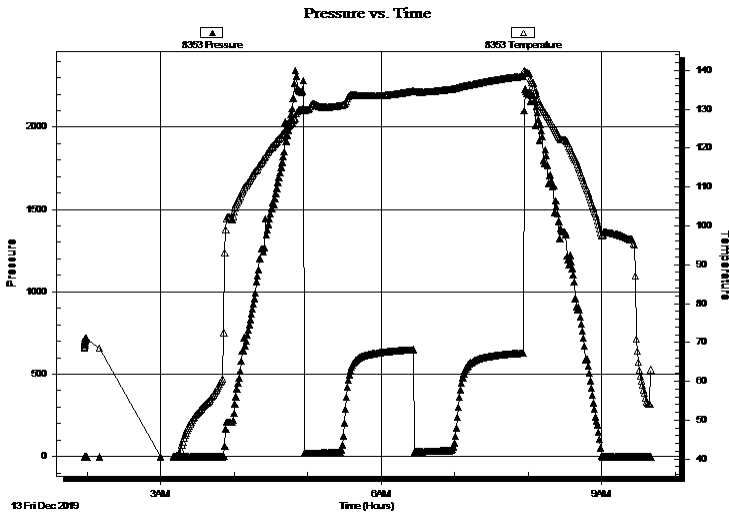
End Time: 09:40:10

Time On Btm:

Time Off Btm:

TEST COMMENT: 30 IF - Blow built to 2"
60 ISI - No return
30 FF - No blow
60 FSI - No return

PRESSURE SUMMARY



Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
30.00	Mud 100%M	0.15

* Recovery from multiple tests

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66465

DST#: 3

ATTN: Robert Hendrix

Test Start: 2019.12.13 @ 01:58:00

Tool Information

Drill Pipe:	Length: 4263.00 ft	Diameter: 3.80 inches	Volume: 59.80 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 148.00 ft	Diameter: 2.25 inches	Volume: 0.73 bbl	Weight to Pull Loose: 58000.00 lb
			<u>Total Volume: 60.53 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 56000.00 lb
Depth to Top Packer:	4423.00 ft			Final 56000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	94.00 ft			
Tool Length:	122.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Shut In Tool	5.00			4400.00	
Hydraulic tool	5.00			4405.00	
Jars	5.00			4410.00	
Safety Joint	3.00			4413.00	
Packer	5.00			4418.00	28.00 Bottom Of Top Packer
Packer	5.00			4423.00	
Stubb	1.00			4424.00	
Recorder	0.00	8353	Inside	4424.00	
Recorder	0.00	8366	Outside	4424.00	
Perforations	25.00			4449.00	
Blank Spacing	65.00			4514.00	
Bullnose	3.00			4517.00	94.00 Bottom Packers & Anchor

Total Tool Length: 122.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66465

DST#: 3

ATTN: Robert Hendrix

Test Start: 2019.12.13 @ 01:58:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 58.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 6.39 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1100.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
30.00	Mud 100%M	0.148

Total Length: 30.00 ft Total Volume: 0.148 bbl

Num Fluid Samples: 0

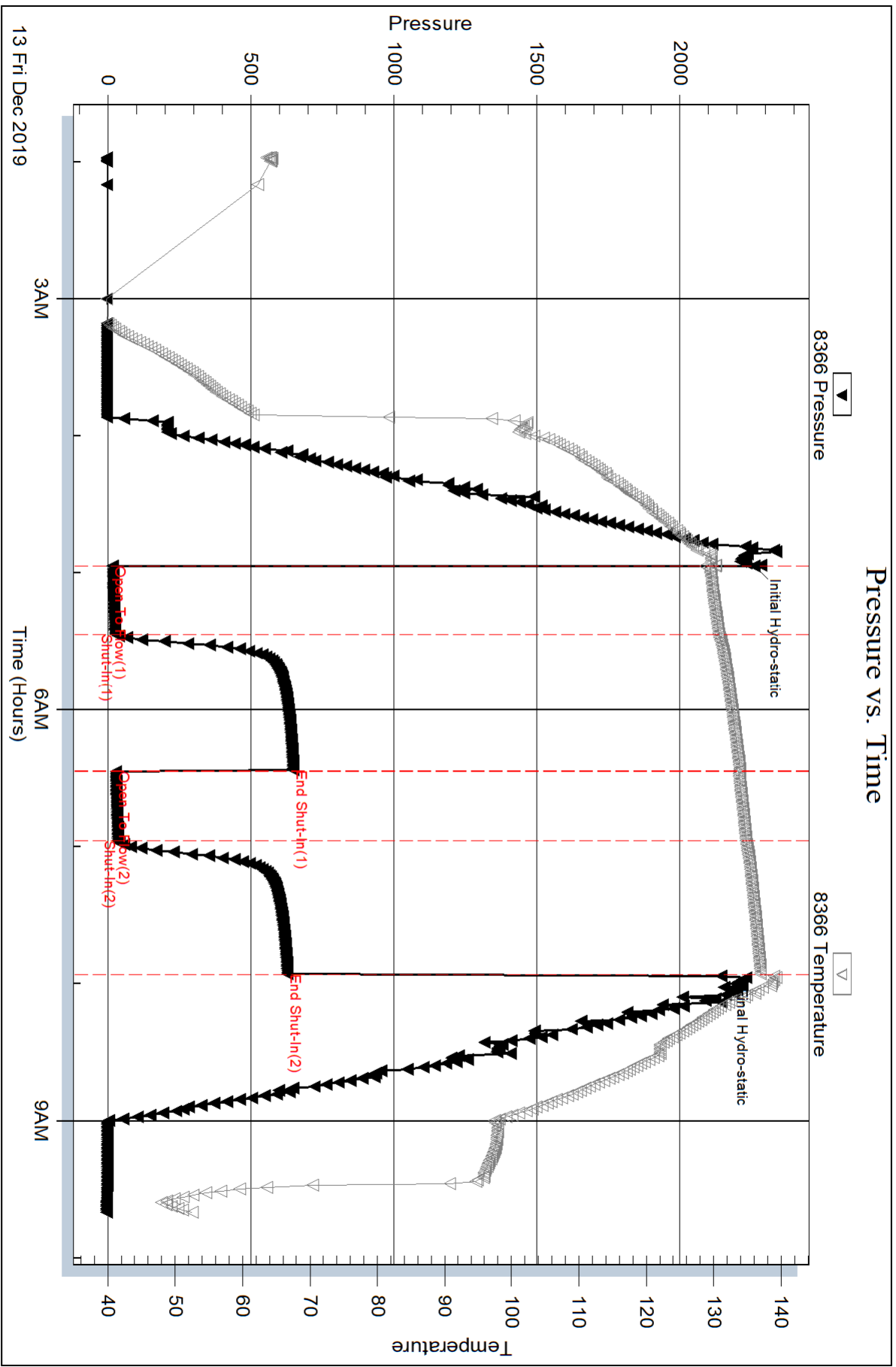
Num Gas Bombs: 0

Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:



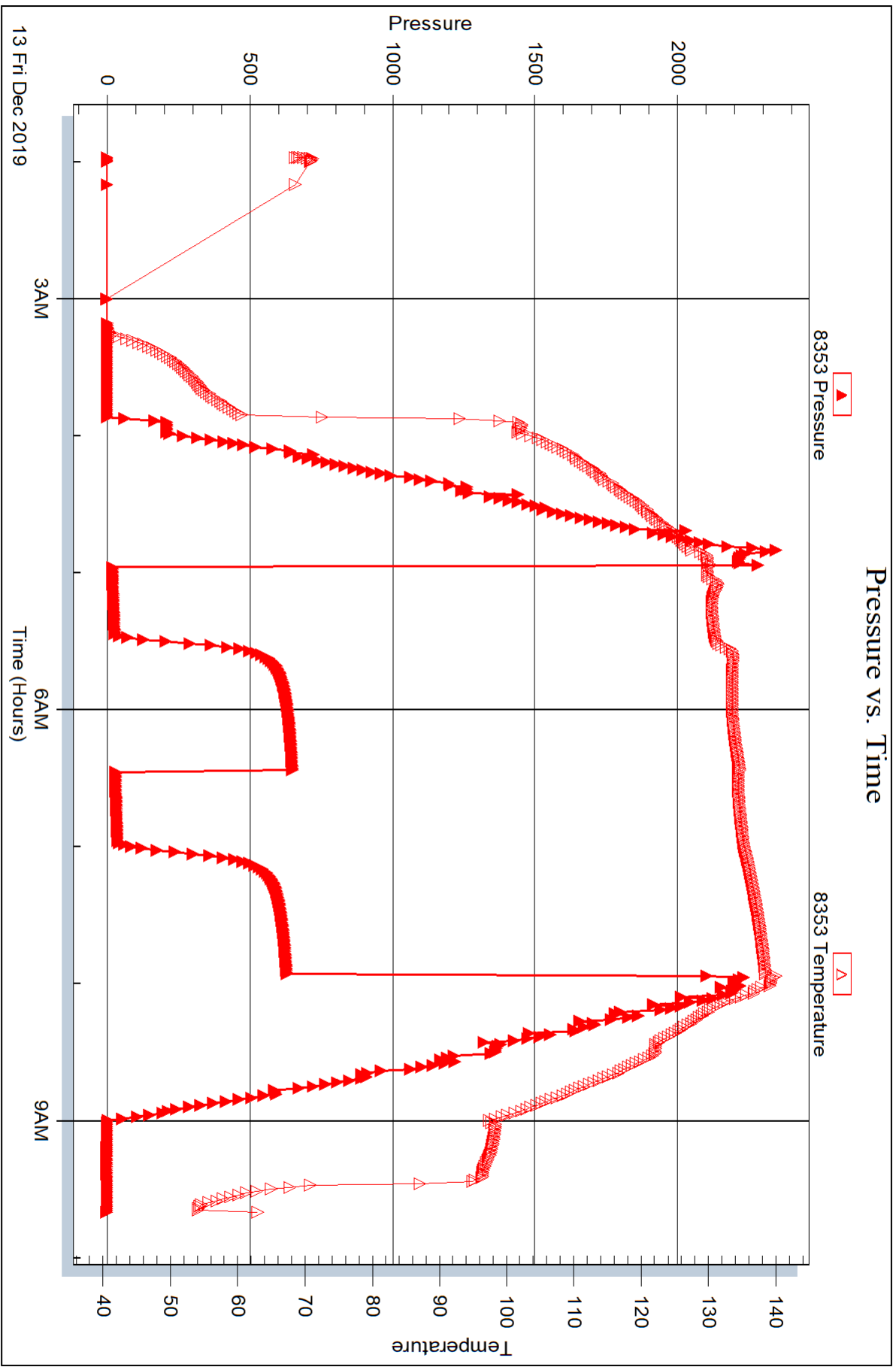
Serial #: 8353

Inside

Murfin Drilling Co. Inc.

Culw ell K #1-20

DST Test Number: 3





DRILL STEM TEST REPORT

Prepared For: **Murfin Drilling Co. Inc.**

250 N. Water STE 300
Wichita KS 67202

ATTN: Robert Hendrix

Culwell K #1-20

20-2s-37w Cheyenne,KS

Start Date: 2019.12.14 @ 16:56:00

End Date: 2019.12.15 @ 01:12:00

Job Ticket #: 66466 DST #: 4

Trilobite Testing, Inc
1515 Commerce Parkway Hays, KS 67601
ph: 785-625-4778 fax: 785-625-5620

Printed: 2019.12.17 @ 09:00:19



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne, KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66466

DST#: 4

ATTN: Robert Hendrix

Test Start: 2019.12.14 @ 16:56:00

GENERAL INFORMATION:

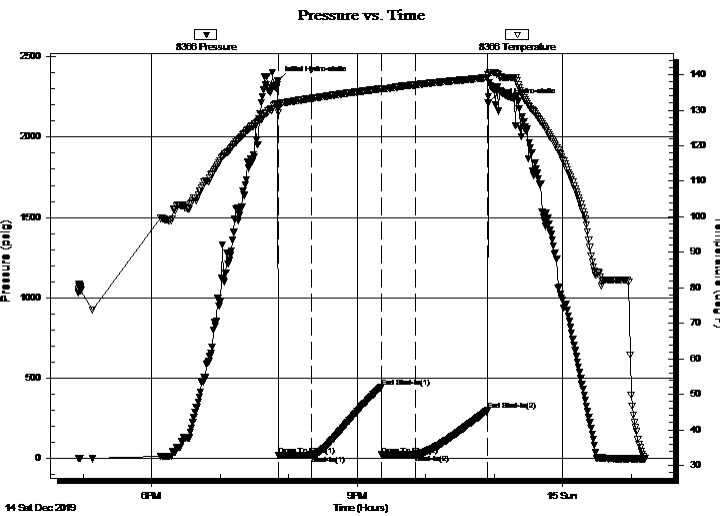
Formation: **Ft. Scott - Celia**
 Deviated: No Whipstock: ft (KB)
 Time Tool Opened: 19:50:50
 Time Test Ended: 01:12:00
 Interval: **4670.00 ft (KB) To 4806.00 ft (KB) (TVD)**
 Total Depth: 4806.00 ft (KB) (TVD)
 Hole Diameter: 7.88 inches Hole Condition: Good
 Test Type: Conventional Bottom Hole (Reset)
 Tester: Ryan Nichols
 Unit No: 71
 Reference Elevations: 3351.00 ft (KB)
 3346.00 ft (CF)
 KB to GR/CF: 5.00 ft

Serial #: 8366

Outside

Press@RunDepth: 22.63 psig @ 4671.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2019.12.14 End Date: 2019.12.15 Last Calib.: 2019.12.15
 Start Time: 16:56:01 End Time: 01:12:00 Time On Btm: 2019.12.14 @ 19:50:40
 Time Off Btm: 2019.12.14 @ 22:54:50

TEST COMMENT: 30 IF - Blow built to 1 1/4"
 60 ISI - No return
 30 FF - No blow
 60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation
0	2353.49	130.79	Initial Hydro-static
1	17.56	129.37	Open To Flow (1)
30	20.61	133.30	Shut-In(1)
91	443.83	136.01	End Shut-In(1)
91	20.69	135.77	Open To Flow (2)
121	22.63	137.14	Shut-In(2)
184	296.33	139.14	End Shut-In(2)
185	2211.44	139.91	Final Hydro-static

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100%M	0.02

* Recovery from multiple tests

Gas Rates

Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)



TRILOBITE TESTING, INC.

DRILL STEM TEST REPORT

Murfin Drilling Co. Inc.
 250 N. Water STE 300
 Wichita KS 67202
 ATTN: Robert Hendrix

20-2s-37w Cheyenne, KS

Culwell K #1-20

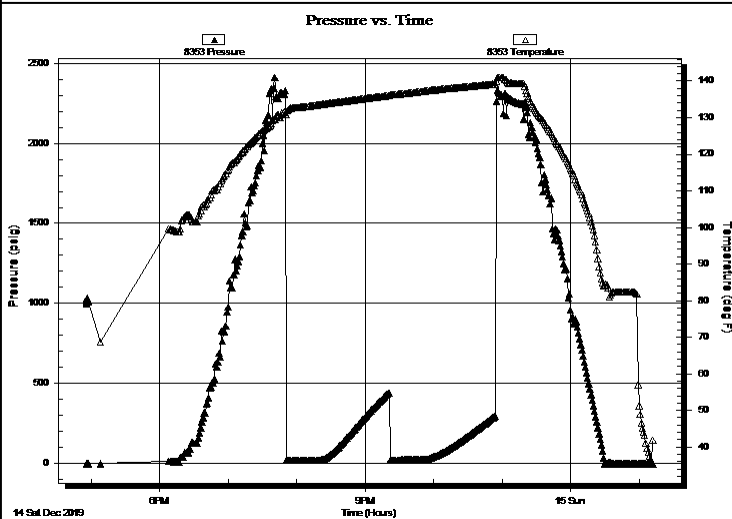
Job Ticket: 66466 **DST#: 4**
 Test Start: 2019.12.14 @ 16:56:00

GENERAL INFORMATION:

Formation: **Ft. Scott - Celia**
 Deviated: No Whipstock: ft (KB)
 Test Type: Conventional Bottom Hole (Reset)
 Time Tool Opened: 19:50:50
 Tester: Ryan Nichols
 Time Test Ended: 01:12:00
 Unit No: 71
Interval: 4670.00 ft (KB) To 4806.00 ft (KB) (TVD)
 Reference Elevations: 3351.00 ft (KB)
 Total Depth: 4806.00 ft (KB) (TVD) 3346.00 ft (CF)
 Hole Diameter: 7.88 inches
 Hole Condition: Good
 KB to GR/CF: 5.00 ft

Serial #: 8353 Inside
 Press@RunDepth: psig @ 4671.00 ft (KB) Capacity: 8000.00 psig
 Start Date: 2019.12.14 End Date: 2019.12.15 Last Calib.: 2019.12.15
 Start Time: 16:56:01 End Time: 01:12:00 Time On Btm:
 Time Off Btm:

TEST COMMENT: 30 IF - Blow built to 1 1/4"
 60 ISI - No return
 30 FF - No blow
 60 FSI - No return



PRESSURE SUMMARY

Time (Min.)	Pressure (psig)	Temp (deg F)	Annotation

Recovery

Length (ft)	Description	Volume (bbl)
5.00	Mud 100%M	0.02

Gas Rates

	Choke (inches)	Pressure (psig)	Gas Rate (Mcf/d)

* Recovery from multiple tests



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

TOOL DIAGRAM

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66466

DST#: 4

ATTN: Robert Hendrix

Test Start: 2019.12.14 @ 16:56:00

Tool Information

Drill Pipe:	Length: 4510.00 ft	Diameter: 3.80 inches	Volume: 63.26 bbl	Tool Weight: 2000.00 lb
Heavy Wt. Pipe:	Length: 0.00 ft	Diameter: 0.00 inches	Volume: 0.00 bbl	Weight set on Packer: 20000.00 lb
Drill Collar:	Length: 148.00 ft	Diameter: 2.25 inches	Volume: 0.73 bbl	Weight to Pull Loose: 70000.00 lb
			<u>Total Volume: 63.99 bbl</u>	Tool Chased 0.00 ft
Drill Pipe Above KB:	16.00 ft			String Weight: Initial 58000.00 lb
Depth to Top Packer:	4670.00 ft			Final 58000.00 lb
Depth to Bottom Packer:	ft			
Interval between Packers:	136.00 ft			
Tool Length:	164.00 ft			
Number of Packers:	2	Diameter: 6.75 inches		

Tool Comments:

Tool Description	Length (ft)	Serial No.	Position	Depth (ft)	Accum. Lengths
------------------	-------------	------------	----------	------------	----------------

Shut In Tool	5.00			4647.00	
Hydraulic tool	5.00			4652.00	
Jars	5.00			4657.00	
Safety Joint	3.00			4660.00	
Packer	5.00			4665.00	28.00 Bottom Of Top Packer
Packer	5.00			4670.00	
Stubb	1.00			4671.00	
Recorder	0.00	8353	Inside	4671.00	
Recorder	0.00	8366	Outside	4671.00	
Perforations	5.00			4676.00	
Blank Spacing	127.00			4803.00	
Bullnose	3.00			4806.00	136.00 Bottom Packers & Anchor

Total Tool Length: 164.00



**TRILOBITE
TESTING, INC.**

DRILL STEM TEST REPORT

FLUID SUMMARY

Murfin Drilling Co. Inc.

20-2s-37w Cheyenne,KS

250 N. Water STE 300
Wichita KS 67202

Culwell K #1-20

Job Ticket: 66466

DST#: 4

ATTN: Robert Hendrix

Test Start: 2019.12.14 @ 16:56:00

Mud and Cushion Information

Mud Type: Gel Chem

Cushion Type:

Oil API:

deg API

Mud Weight: 9.00 lb/gal

Cushion Length:

ft

Water Salinity:

ppm

Viscosity: 67.00 sec/qt

Cushion Volume:

bbbl

Water Loss: 5.99 in³

Gas Cushion Type:

Resistivity: ohm.m

Gas Cushion Pressure:

psig

Salinity: 1400.00 ppm

Filter Cake: 2.00 inches

Recovery Information

Recovery Table

Length ft	Description	Volume bbl
5.00	Mud 100%M	0.025

Total Length: 5.00 ft Total Volume: 0.025 bbl

Num Fluid Samples: 0

Num Gas Bombs: 0

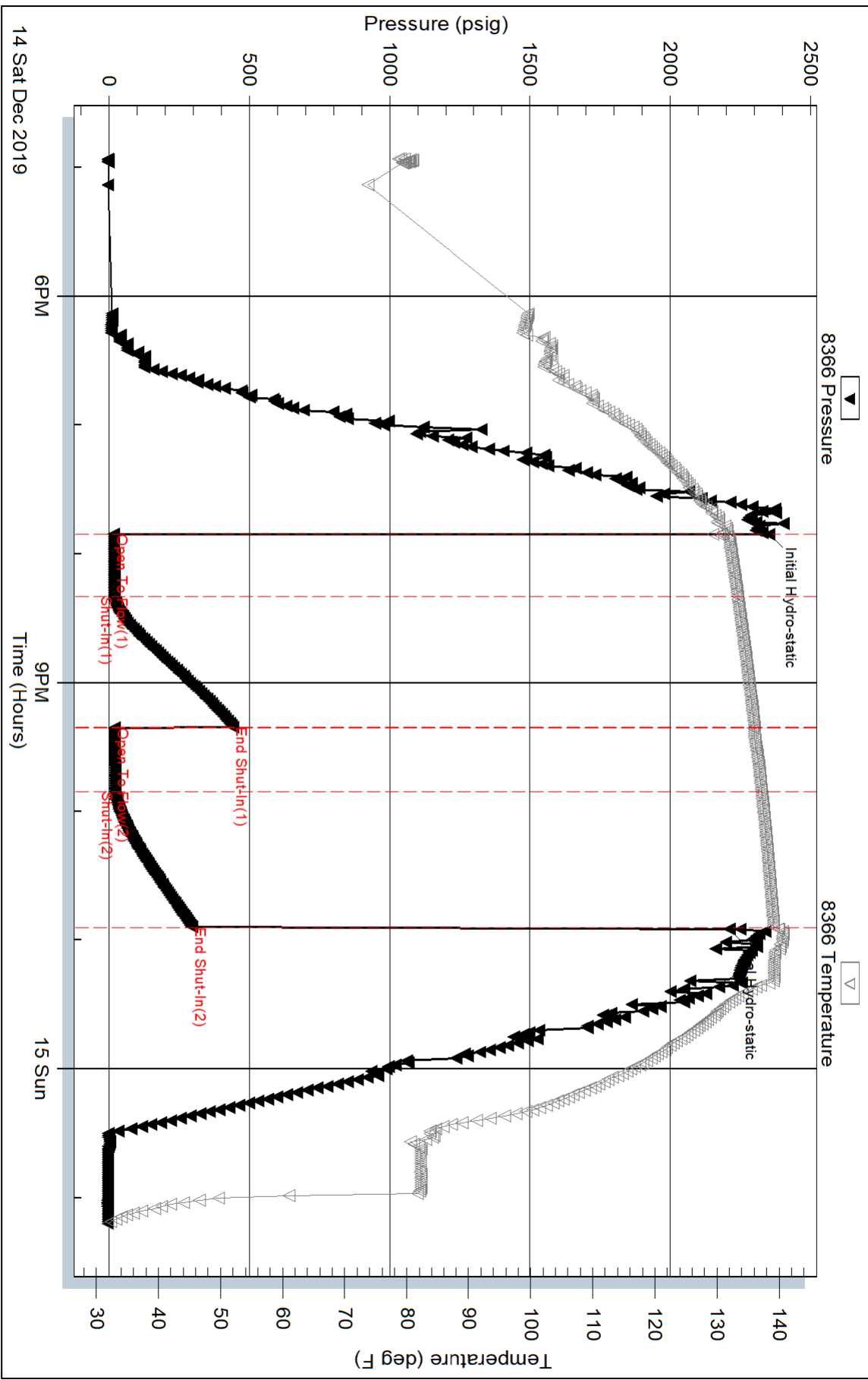
Serial #:

Laboratory Name:

Laboratory Location:

Recovery Comments:

Pressure vs. Time



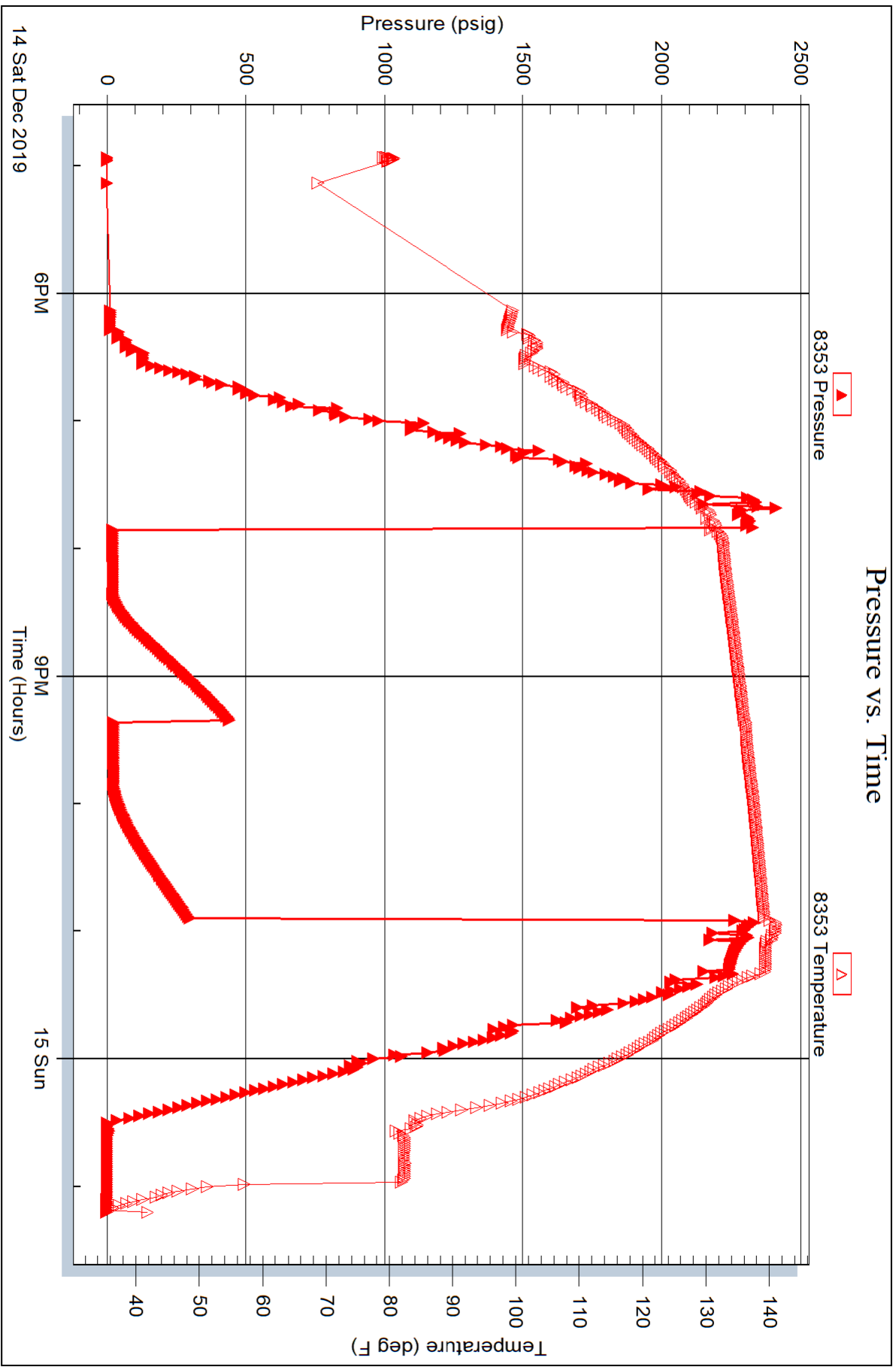
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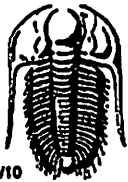
Inside

Murfin Drilling Co. Inc.

Oilwell K #1-20

DST Test Number: 4





TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66463

NO.

Well Name & No. Culwell K #1-20 Test No. 1 Date 12/11/19
 Company Martin Drilling Co. Inc. Elevation 7351 KB 3346 GL
 Address 250 N. Wate STE 300 Wichita KS 67202
 Co. Rep/Geo. Robert Hendrix Rig Martin #3
 Location: Sec. 20 Twp 2S Rge. 37W Co. Cheyenne State KS

Interval Tested 4235 - 4318 Zone Tested LKC "A"
 Anchor Length 83' Drill Pipe Run 4075' Mud Wt. 8.8
 Top Packer Depth 4230 Drill Collars Run 148' Vis 60
 Bottom Packer Depth 4235 Wt. Pipe Run 0' WL 6.8
 Total Depth 4318 Chlorides 1300 ppm System LCM 2

Blow Description 30 IF - Blow built to 1/4" died back to surface
60 ISI - No return
30 FF - No blow
60 FSI - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>5'</u>	<u>Mud</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

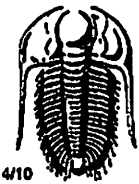
Rec Total 5' BHT 133° Gravity — API RW — @ — °F Chlorides — ppm

(A) Initial Hydrostatic <u>2112</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>09:00</u>
(B) First Initial Flow <u>19</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>09:30</u>
(C) First Final Flow <u>20</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>11:35</u>
(D) Initial Shut-In <u>1178</u>	<input type="checkbox"/> Circ.Sub	T-Pulled <u>14:35</u>
(E) Second Initial Flow <u>20</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>16:30</u>
(F) Second Final Flow <u>24</u>	<input checked="" type="checkbox"/> Mileage <u>134 RT</u>	Comments
(G) Final Shut-In <u>1129</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2002</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> EM Tool

Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Shale Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Extra Copies
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
	<input type="checkbox"/> Accessibility	Total <u>1759</u>
	Sub Total <u>1759</u>	MP/DST Disc't

Approved By _____ Our Representative [Signature]

Trilobite Testing Inc. shall not be liable for damaged of any kind of the property or personnel of the one for whom a test is made, or for any loss suffered or sustained, directly or indirectly, through the use of its equipment, or its statements or opinion concerning the results of any test, tools lost or damaged in the hole shall be paid for at cost by the party for whom the test is made.



TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66464

NO.

Well Name & No. Calwell K # 1-20 Test No. 2 Date 12/12/19
 Company Murfin Drilling Co. Inc. Elevation 3351 KB 3346 GL
 Address 250 N. Water STE 300 Wichita KS 67202
 Co. Rep / Geo. Robert Hendrix Rig Murfin # 3
 Location: Sec. 20 Twp 25 Rge. 37W Co. Cheyenne State KS

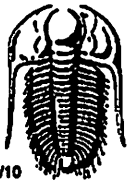
Interval Tested 4310 - 4383 Zone Tested 2KC "B"
 Anchor Length 73' Drill Pipe Run 4166' Mud Wt. 9.0
 Top Packer Depth 4305 Drill Collars Run 148' Vis 70
 Bottom Packer Depth 4310 Wt. Pipe Run 0' WL 6.8
 Total Depth 4383 Chlorides 900 ppm System LCM 2
 Blow Description 30 IF - Blow built to 1 1/2"
60 ISI - No return
30 FF - No blow
60 FSI - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>5'</u>	<u>Mud w/ soil spots in tool</u>				
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 5' BHT 1340 Gravity API RW @ °F Chlorides ppm

(A) Initial Hydrostatic <u>2163</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>02:00</u>
(B) First Initial Flow <u>17</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>02:29</u>
(C) First Final Flow <u>21</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>04:51</u>
(D) Initial Shut-In <u>1202</u>	<input type="checkbox"/> Circ Sub <u> </u>	T-Pulled <u>07:51</u>
(E) Second Initial Flow <u>21</u>	<input type="checkbox"/> Hourly Standby <u> </u>	T-Out <u>09:15</u>
(F) Second Final Flow <u>26</u>	<input checked="" type="checkbox"/> Mileage <u>134 RT</u>	Comments <u> </u>
(G) Final Shut-In <u>1146</u>	<input type="checkbox"/> Sampler <u> </u>	<input type="checkbox"/> EM Tool <u> </u>
(H) Final Hydrostatic <u>2099</u>	<input type="checkbox"/> Straddle <u> </u>	<input type="checkbox"/> Ruined Shale Packer <u> </u>
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer <u> </u>	<input type="checkbox"/> Ruined Packer <u> </u>
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer <u> </u>	<input type="checkbox"/> Extra Copies <u> </u>
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder <u> </u>	Sub Total <u>0</u>
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby <u> </u>	Total <u>1759</u>
	<input type="checkbox"/> Accessibility <u> </u>	MP/DST Disc't <u> </u>
	Sub Total <u>1759</u>	

Approved By _____ Our Representative Robert Hendrix
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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66465

NO.

Well Name & No. Culwell K #1-20 Test No. 3 Date 12/13/19
 Company Murfin Drilling Co Inc. Elevation 3351 KB 3346 GL
 Address 250 N Water STE 300 Wichita KS 67202
 Co. Rep / Geo. Robert Hendrix Rig Murfin # 3
 Location: Sec. 20 Twp 2S Rge. 37W Co. Cherokee State KS

Interval Tested 4423 - 4517 Zone Tested LKC "H - J"
 Anchor Length 94' Drill Pipe Run 4263' Mud Wt. 9.0
 Top Packer Depth 4418 Drill Collars Run 146° Vls 58
 Bottom Packer Depth 4423 Wt. Pipe Run 0' WL 6.4
 Total Depth 4517 Chlorides 1100 ppm System LCM 2

Blow Description 30 IF - Blow built to 2"
60 ISE - No return
30 FF - No blow
60 FSE - No return

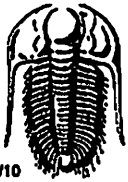
Rec	Feet of	%gas	%oil	%water	%mud
<u>30'</u>	<u>Mud</u>			<u>100</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 30' BHT 137° Gravity — API RW — @ — F Chlorides — ppm

(A) Initial Hydrostatic <u>2260</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>01:15</u>
(B) First Initial Flow <u>16</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>01:58</u>
(C) First Final Flow <u>26</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>04:57</u>
(D) Initial Shut-In <u>648</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>07:57</u>
(E) Second Initial Flow <u>29</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>09:30</u>
(F) Second Final Flow <u>36</u>	<input checked="" type="checkbox"/> Mileage <u>134 RT</u>	Comments
(G) Final Shut-In <u>628</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>2144</u>	<input type="checkbox"/> Straddle	<input type="checkbox"/> EM Tool
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> Ruined Shale Packer
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Packer
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Extra Copies
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby	Sub Total <u>0</u>
	<input type="checkbox"/> Accessibility	Total <u>1759</u>
	Sub Total <u>1759</u>	MP/DST Disc't

Approved By _____ Our Representative Ryan Phillips

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TRILOBITE TESTING INC.

1515 Commerce Parkway • Hays, Kansas 67601

Test Ticket 66466

NO.

Well Name & No. Culwell K # 1-20 Test No. 4 Date 12/14/19
 Company Martin Drilling Co. Inc. Elevation 3351 KB 3346 GL
 Address 250 N. Water STE 300 Wichita KS 67202
 Co. Rep / Geo. Robert Hendrix Rig Martin # 3
 Location: Sec. 20 Twp 2S Rge. 37W Co. Cheyenne State KS

Interval Tested 4670 - 4806 Zone Tested Ft. Scott - Celia
 Anchor Length 136' Drill Pipe Run 4510' Mud Wt. 9.2
 Top Packer Depth 4665 Drill Collars Run 148' Vls 67
 Bottom Packer Depth 4670 Wt. Pipe Run 0' WL 6.0
 Total Depth 4806 Chlorides 1400 ppm System LCM 3
 Blow Description 30 IF - Blow built to 1 1/4"
60 ISI - No return
30 FF - No blow
60 FSI - No return

Rec	Feet of	%gas	%oil	%water	%mud
<u>5'</u>	<u>Mud</u>			<u>100%</u>	
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud
Rec	Feet of	%gas	%oil	%water	%mud

Rec Total 5' BHT 1390 Gravity — API RW — @ — F Chlorides — ppm

(A) Initial Hydrostatic <u>2353</u>	<input checked="" type="checkbox"/> Test <u>1300</u>	T-On Location <u>16:15</u>
(B) First Initial Flow <u>18</u>	<input checked="" type="checkbox"/> Jars <u>250</u>	T-Started <u>16:56</u>
(C) First Final Flow <u>21</u>	<input checked="" type="checkbox"/> Safety Joint <u>75</u>	T-Open <u>19:51</u>
(D) Initial Shut-In <u>444</u>	<input type="checkbox"/> Circ Sub	T-Pulled <u>22:51</u>
(E) Second Initial Flow <u>21</u>	<input type="checkbox"/> Hourly Standby	T-Out <u>01:15</u>
(F) Second Final Flow <u>23</u>	<input checked="" type="checkbox"/> Mileage <u>134 RT</u>	Comments
(G) Final Shut-In <u>296</u>	<input type="checkbox"/> Sampler	
(H) Final Hydrostatic <u>1182</u>	<input type="checkbox"/> Straddle	
Initial Open <u>30</u>	<input type="checkbox"/> Shale Packer	<input type="checkbox"/> EM Tool
Initial Shut-In <u>60</u>	<input type="checkbox"/> Extra Packer	<input type="checkbox"/> Ruined Shale Packer
Final Flow <u>30</u>	<input type="checkbox"/> Extra Recorder	<input type="checkbox"/> Ruined Packer
Final Shut-In <u>60</u>	<input type="checkbox"/> Day Standby	<input type="checkbox"/> Extra Copies
	<input type="checkbox"/> Accessibility	Sub Total <u>0</u>
	Sub Total <u>1759</u>	Total <u>1759</u>
		MP/DST Disc't

Approved By _____ Our Representative Robert Hendrix

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MDCI
 Culwell 'K' #1-20
 330' FNL 600' FEL
 Sec. 20-2S-37W
 3351' KB

Formation	Sample top	Datum	Ref	Log tops	Datum	Ref
Anhydrite	3240	+111	Flat	3242	+109	-2
B/Anhydrite	3274	+77	Flat	3277	+74	-3
Topeka	4071	-720	-15	4063	-712	-7
Oread	4206	-855	-6	4209	-858	-9
Lansing	4282	-931	-8	4284	-933	-10
Stark	4514	-1163	-12	4512	-1161	-10
Mound City	4563	-1212	-9	4567	-1216	-13
Ft Scott	4691	-1340	-9	4696	-1345	-14
Oakley	4770	-1419	-14	4774	-1423	-18
RTD	4950					
LTD				4954		